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- *JP61141835(A).pdf*

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On October 5, 2004, before me, ROBERT E. FROMSON, Notary Public, personally appeared Gabriel A. Rodino, who identified himself to me by presenting his driver's license, and is the person whose name is subscribed to the within instrument, and he acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Robert E. Fromson
Signature of Notary

ROBERT E. FROMSON
Commission # 1406422
Notary Public - California
Los Angeles County
My Comm. Expires Apr 18, 2007

-Translation from Japanese into English-

19. Japanese Patent Office (JP)
12. Publication of Unexamined Patent Application (A)
11. Kokai Number [Unexamined Patent Application Number]
Sho 61-141835 (1986)
43. Date of Publication of Unexamined Patent Application
28 June 1986
51. Int. Cl.[4]
A 22 C 5/00

Identification Symbol
JPO File Number
7421-4B
Request for Examination Not requested
Number of Inventions: One (1)

(Total number of pages: Five (5))

54. Title of the Invention
Pre-slaughter processing method for animals that are used for food

21. Application Number
Sho 59-265638 (1984)

22. Filing Date
17 December 1984

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[1] *Translator's Note: Underlined terms are proper names, the accurate transliteration of which could not be verified. The reading produced is a possible rendition of the Japanese characters.*

SPECIFICATION

1. Title of the Invention

Pre-slaughter treatment method for animals used as edible meat

2. Claim

(1) A pre-slaughter treatment method for animals used as edible meat characterized by the fact that livestock, fish, and other animals used as edible meat are allowed to inhale carbon monoxide before their breathing is terminated.

3. Detailed Explanation of the Invention

(Industrial Field of Application)

The invention pertains to a pre-slaughter treatment method for livestock or fish or other animals that are used for food and deals with a method wherein the color of the meat is kept bright and the blood is effectively removed.

(Prior Art)

Conventionally, even when meat and fish are kept at low temperatures, the color of the meat changes to brown during storage detracting from the commercial value and that has been a problem. To solve that problem, means have been available to maintain the color tone whereby raw meat is impregnated in the solutions of coloring agents. However, [those processes] can be cumbersome and the color tone inherently associated with raw meat has been difficult to duplicate, posing problems. Moreover, with animals that are used for food, the blood remaining in the flesh adversely affected the taste. In addition, [the meat] may spoil because of bacteria contained in the blood, and for that reason the blood needed to be released immediately after slaughtering to eliminate the blood. However, the blood remaining formed blood clots detracting from the appearance and adversely affected the taste creating another problem.

(Problems for the Invention to Solve)

The invention was conceived due to the problems above. The objectives are to effectively remove the blood after an animal that is used for food has been slaughtered and to prevent the meat from becoming brown during storage by keeping the color bright.

(Means of Solving the Problems)

The invention enables raw meat that has been stored after [an animal] has been slaughtered to look fresh because the animal that is used for food, such as livestock or fish, is allowed to inhale carbon monoxide before its breathing is terminated. As a result, the carbon monoxide in lieu of oxygen bonds to the flesh via the blood and the blood vessels. The treatment is designed to maintain the raw meat in storage after slaughtering brightly colored, and to prevent deterioration in the product quality caused by blood clots by preventing blood from coagulating after the slaughtering, by improving the effectiveness of the blood removal.

(Operation of the Invention)

The invention keeps the raw meat brightly colored after slaughtering and also prevents blood fluidity from deteriorating by allowing the animal that is to be used for food to inhale carbon monoxide and the carbon monoxide to bond to the hemoglobin and myoglobin in the blood and in the flesh.

(Constitution of the Invention)

The method of the invention is discussed in detail.

As far as animals that are used for food are concerned, there are cattle, pigs, and other types of domestic livestock, chicken and other domestic fowl, and various kinds of fish. To inhale carbon monoxide, in the case of domestic livestock, an animal is placed in a sealed chamber prior to being slaughtered and carbon monoxide gas is introduced into the chamber for the animal to inhale. As an alternative, an airtight mask-like breathing apparatus may be placed over the nose and mouth of the animal so the animal inhales the carbon monoxide that has been introduced into the mask. With fowl and similar animals, the animal is hung upside down to release the blood. However, the animal is made to breathe carbon monoxide before that by moving the animal through a carbon monoxide gas chamber while hanging down or before it is hung.

In addition, with fish, the fish are allowed to swim in a vat of water, and carbon monoxide is introduced into that water to make the fish inhale the carbon monoxide.

As far as the atmosphere of the gas chamber is concerned, either air is replaced with carbon monoxide or carbon monoxide is mixed with air.

The animal may be allowed to die by inhalation of carbon monoxide, or the animal may be left alive even after it has been allowed to inhale carbon monoxide and then slaughtered by other means.

The carbon monoxide that the living animal has inhaled is transported to ends of the blood vessels and dispersed throughout the flesh. The carbon monoxide binds with hemoglobin or myoglobin in the blood and flesh more readily than oxygen. Therefore, it bonds with the blood and the flesh and maintains the color of the raw meat bright after slaughtering. In addition, it prevents the flow properties of the blood from deteriorating. Specifically with meat, the color of the raw meat will maintain a bright red color, and the color change to brown with elapsed time will be prevented. As far as fish are concerned, with red fish, the red muscles and the blood-colored muscles will remain bright red; with white fish, blood-colored muscle will remain bright red. The color will not change to brown even when the fish is left in the air for several days.

Moreover, since the flow properties of the blood after the slaughtering [of the animal] will be kept from deteriorating, the blood is removed effectively and no blood clots are formed from residual blood.

(Effects of the Invention)

Based on the invention, the animal that is to be used for food, such as livestock or fish, is allowed to inhale carbon monoxide prior to terminating its breathing, and, for that reason, the animal that is to be used for food will inhale the carbon monoxide and the carbon monoxide will be incorporated into its blood. The carbon monoxide instead of oxygen bonds with the blood and the flesh and prevents the deterioration in the flow properties of the blood after the slaughter. In addition, the color of the raw meat will remain fresh over a long period of time. Since the treatment prevents deterioration of the flow properties of the blood, the blood is removed effectively preventing the deterioration in taste and the spoilage caused by residual blood. In addition, since the living creature is allowed to inhale carbon monoxide prior to being slaughtered, the carbon monoxide is allowed to disperse to the end of the blood vessels and the aforementioned effects are achieved over the entire slaughtered animal.

(Working Examples)

Working examples of the invention are explained with reference to the figures.

Working Example 1

(a), a rabbit to be used for experimental purposes shown in Fig. 1, was placed in an airtight container 1, and gas was introduced from a carbon monoxide gas cylinder 2. Air was released by opening the exhaust valve 3, and the rabbit 3 died in thirty (30) minutes after that the exhaust valve 3 was closed. In the diagram, 4 is a decompression valve and 5 is an air valve.

Next, the rabbit was taken out and sectioned. That raw meat was brighter red than the raw meat of a rabbit that was not made to inhale carbon monoxide. The flow properties of the blood were excellent, and the blood was removed effectively. Moreover, when that raw meat was stored in a refrigerator at 0°C-3°C, the color did not change to brown even after fourteen (14) days.

Working Example 2

As shown in Fig. 2, a farm raised young yellowtail 1 weighing approximately 3 kg was placed in seawater placed inside a polyethylene pouch 6 that was in a bucket. A gas under reduced pressure was introduced from a carbon monoxide cylinder 2 and the opening on the polyethylene container 6 was tightened to prevent the gas from escaping. In the diagram, 7 is an air valve and 8 is a flow meter. The flow of the gas was set at 1 liter per minute, and the yellowtail that had turned on its side was taken out approximately twenty (20) minutes later. It was filleted into three pieces, the skin was removed, and changes were noted. As a result, the color of the red muscles and the blood-colored muscles was a bright red color. The blood was removed effectively, the color of the blood was bright red, and the color tone of the entire fish was bright. Even after twenty (20) days had passed in a refrigerator at a temperature of 0°C-5°C, hardly any color change was noted.

Carbon monoxide binds with hemoglobin in blood and interferes with the ability of the blood to take up oxygen causing carbon monoxide poisoning. However, if the carbon monoxide that has bonded with the hemoglobin in the blood or the myoglobin or the hemoglobin in the muscle of the fish enters the stomach of a human being, carbon monoxide poisoning is inconceivable. The fish meat that was processed in Working Example 2 was given to guinea pigs that are used for experimental purposes in large daily doses for seven (7) days, and no irregularities of any kind were noted. In addition, when that same fish meat was sliced as sashimi and used as test food, taste, smell, and other food product quality attributes were not found to have been compromised at all.

4. Brief Explanation of the Drawings

Fig. 1 is a diagram that shows one example of the apparatus that is used in the method that pertains to the invention; the view is from the side. Fig. 2 is a diagram that shows another example of the method that pertains to the invention; the view is from the side.

Fig. 1

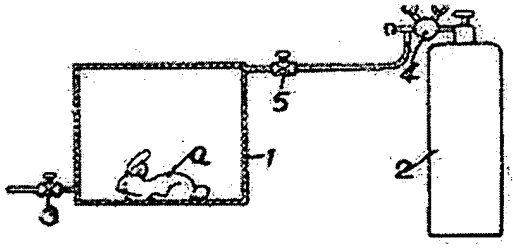
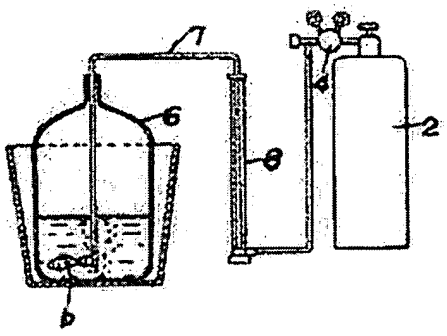


Fig. 2



Amendment Application (Voluntary)

23 January 1985

[Stamp:] Qualified

To the Commissioner of the Japanese Patent Office Manabu Shiga

1. Case Identification
   Sho 59-265638 (1984)

2. Title of the Invention
   Pre-slaughter treatment method for animals used as edible meat

3. Party Filing the Amendment
   Applicant for a patent

   Harumitsu Iimura (and two (2) other individuals)

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   [Seal]

5. Date of Amendment Directive
   Not applicable

6. Parts Amended
   Entire specifications.

7. Content of the Amendment
   As per attachment.

[Stamp:] [Japanese] Patent Office, 27 January 1985, [illegible]

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Based on the invention, the animal that is to be used for food, such as livestock or fish, is allowed to inhale carbon monoxide prior to terminating its breathing, and, for that reason, the animal that is to be used for food will inhale the carbon monoxide and the carbon monoxide will be incorporated into its blood. The carbon monoxide instead of oxygen bonds with the blood and the flesh and prevents the deterioration in the flow properties of the blood after the slaughter. In addition, the color of the raw meat will remain fresh over a long period of time. Since the treatment prevents deterioration of the flow properties of the blood, the blood is removed effectively preventing the deterioration in taste and the spoilage caused by residual blood. In addition, since the living creature is allowed to inhale carbon monoxide prior to being slaughtered, the carbon monoxide is

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Working Example 2

As shown in Fig. 2, a farm raised young yellowtail 1 weighing approximately 3 kg was placed in seawater placed inside a polyethylene pouch 6 that was in a bucket. A gas under reduced pressure was introduced from a carbon monoxide cylinder 2 and the opening on the polyethylene container 6 was tightened to prevent the gas from escaping. In the diagram, 7 is an air valve and 8 is a flow meter. The flow of the gas was set at 1 liter per minute, and the yellowtail that had turned on its side was taken out approximately twenty (20) minutes later. It was filleted into three pieces, the skin was removed, and changes were noted. As a result, the color of the red muscles and the blood-colored muscles was a bright red color. The blood was removed effectively, the color of the blood was bright red, and the color tone of the entire fish was bright. Even after twenty (20) days had passed in a refrigerator at a temperature of 0°C-5°C, hardly any color change was noted.

Carbon monoxide binds with hemoglobin in blood and interferes with the ability of the blood to take up oxygen causing carbon monoxide poisoning. However, if the carbon monoxide that has bonded with the hemoglobin in the blood or the myoglobin or the hemoglobin in the muscle of the fish enters the stomach of a human being, carbon monoxide poisoning is inconceivable. The fish meat that was processed in Working Example 2 was given to guinea pigs that are used for experimental purposes in large daily doses for seven (7) days, and no irregularities of any kind were noted. In addition, when that same fish meat was sliced as sashimi and used as test food, taste, smell, and other food product quality attributes were not found to have been compromised at all.

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⑲日本国特許庁（JP）　⑪特許出願公開

⑫公開特許公報（A）　昭61－141835

⑤1Int.Cl.⁴　識別記号　庁内整理番号　⑬公開　昭和61年(1986)6月28日

A 22 C 5/00　7421－4B

審査請求　未請求　発明の数 1　（全5頁）

⑤4発明の名称　食肉用動物の屠殺前処理方法

⑳特　願　昭59－265638

㉒出　願　昭59(1984)12月17日

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明　細　書（2）

1．発明の名称

食肉用動物の屠殺前処理方法

2．特許請求の範囲

（1）　禽獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させることを特徴とする食肉用動物の屠殺前処理方法。

3．発明の詳細な説明

（産業上の利用分野）

本発明は、禽獣、魚等の食肉用動物の屠殺前処理方法にかかり食肉の色を新鮮に保持しかつ血抜き効果を良くする方法に関する。

（従来の技術）

従来獣肉、魚肉等は低温で保持した場合も保存中に肉色が褐色に変化し商品価値を低下するという問題があり、この問題を解決するために発色剤溶液に生肉を浸漬して色調を保つ手段もあるが、手数がかかりかつ生肉本来の色調を出し難いという問題もある。さらに食肉用動物は肉質に血液が残存すると味が悪くなり、かつ血液が含むバクテリアによって腐敗し易くなるため屠殺後は直ちに放血して血液を除去するものであるが残存した血液が血塊となって残り外観を害いかつ味を低下させるという問題もあった。

（発明が解決しようとする問題点）

本発明は、上述の問題に鑑み食肉用動物の屠殺後の血抜き効果が良く、かつ食肉の保蔵中の変質を防ぎ鮮色に保持しようとするものである。

（問題点を解決するための手段）

本発明は、禽獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させることにより、血液中及び血管を介して肉質中に酸素の代りに一酸化炭素を結合させ、屠殺後の保蔵される生肉を鮮色に保持させるとともに屠殺後の血抜の凝血を防ぎ血抜き効果を高め血塊による品質低下を防止しようとするものである。

（作用）

本発明は、食肉用動物に一酸化炭素を呼吸させることにより血液中及び肉質中のヘモグロビンやミオグロビンに一酸化炭素が結合され、屠殺後の

生肉の色を鮮色に保つとともに血液の流動性の低下を防止するものである。

〔発明の構成〕

本発明の方法を詳述する。

食肉用動物としては牛、豚等の家畜類、鶏等の家禽類、魚類等があり、一酸化炭素呼吸に際しては、家畜類の場合は屠殺に先立って密閉室に入れ、一酸化炭素ガスを室内に吹き込むことによりこれを呼吸させるか或は個々の動物の鼻口部にマスク状に気密状の吸入器を当て、これに一酸化炭素を送り込むことによって吸入させる。禽類の場合は逆さ吊りして放血するがその前に吊下げ状態で一酸化炭素ガス室を通過させるか或は吊下げる前に一酸化炭素ガス室に入れることにより一酸化炭素を呼吸させる。

また魚類の場合は、水槽中で遊泳させ、その水中に一酸化炭素を吹き込むみことにより一酸化炭素を呼吸させる。

ガス室の雰囲気は空気と一酸化炭素を置換させたもの或は空気と一酸化炭素が混合しているもの何れでもよい。

さらに動物は一酸化炭素の呼吸によって死に至らしめるか或は一酸化炭素呼吸後も生存させ他の手段によって屠殺してもよい。

生体に吸入された一酸化炭素は、血液によって血管の末端まで運ばれて血液並に肉質中にくまなく分散し、一酸化炭素は酸素よりも血液並に肉質中のヘモグロビンやミオグロビンを結合し易いから血液並に肉質と結合し屠殺後の生肉の色を全体に亘って鮮色に保つとともに血液の流動性の低下を防止する。即ち禽獣肉の場合は生肉の色を鮮紅色に保ち時間の経過によって褐色に変色するのが防止される、また魚肉の場合は、赤身の点においては赤色筋と血合い筋の色が鮮紅色となり、白身の魚においては血合い筋の色が鮮紅色となり、数日間空中に放置しても褐色に変色することがない。

また屠殺後の血液の流動性が低下が防止されるから、血抜き効果が良く残存した血液により血斑が生ずるようなことがない。

〔発明の効果〕

本発明によれば、禽獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させるため、食肉用動物が一酸化炭素を呼吸することにより血液中に一酸化炭素がとり入れられ酸素に代って血液並に肉質と結合し屠殺後の血液の流動性の低下を防止するとともに生肉の色を長期に亘って鮮色に保たせることができる。さらに血液の流動性の低下が防止されるため血抜き効果が良く血液の残存による味の低下や腐敗の発生を防止することがでる。また屠殺前の生体に一酸化炭素を呼吸させるため一酸化炭素の分散が血管の末端まで行われたり前述の効果を屠体全体に亘って有効に及ぼすことができる。

〔実施例〕

本発明の実施例を添附図面によって説明する。

実施例１

第１図に示されるように実験用ウサギａを、気密箱１に入れ、一酸化炭素ガスボンベ２からガスを送入し、排気弁３を開いて空気を追い出した後は排気弁３を閉じ３０分後ウサギａを死に至らしめた。図において４は減圧弁、５は送気弁である。

次にウサギａを取出して解体したがその生肉は一酸化炭素を呼吸させないウサギの生肉と比べて鮮紅色を呈しており、血液は流動性が高く血抜きが良好に行われた。さらにこの生肉を０℃～３℃の冷蔵庫内に放置したところ、１４日後においても色が褐色に変る現象が起らなかった。

実施例２

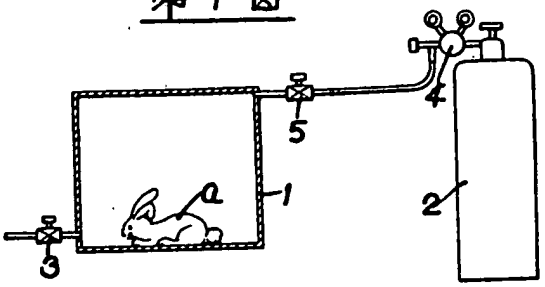
第２図に示すように、雄ハマチｂ１尾約３㎏のものを、バケツに入ったポリエチレン袋６内の海水中に入れ、一酸化炭素ボンベ２から減圧したガスを導入し、ポリエチレン袋６の口をしばってガスの散逸を防止した。図において７は送気管、８は流量計である。ガスの流量は１ℓ／分とし約２０分後横転したハマチｂを取出して三枚におろし皮を剥いでその後の変化をみた。その結果、赤色筋と血合の筋の色が鮮紅色を呈し、血抜きは良好であり血液の色が鮮紅色で魚肉全体の色調が鮮かであり、庫内温度０℃～５℃の冷蔵庫内で２０日間経過後も色調の変化は殆どみられなかった。

なお、一酸化炭素は血液中のヘモグロビンと結合し、酸素の取入れ作用を阻害するのでガス中毒作用があるが、すでに魚の血液中のヘモグロビンや筋肉中のミオグロビンあるいはヘモグロビンと結びついた一酸化炭素が人間の口に入った場合には、ガス中毒作用はまったく考えられない。事実実験用モルモットに実施例2で処理した魚肉を毎日多量に7日間与え続けたが、なんらの異状を認められなかった。また、同じ魚肉を刺身として試食してところ、味、香など食品としての品質を損なうことがまったく認められなかった。

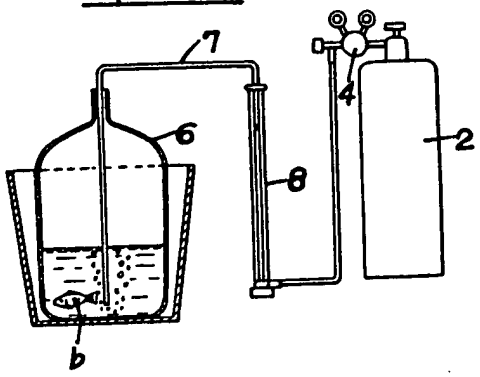
4．図面の簡単な説明

第1図は本発明の方法に用いられる装置の一実施例を示す側面図、第2図は同上他の実施例を示す側面図である。

第1図



第2図



手続補正書（自発）

昭和60年01月23日

特許庁長官　志賀　学　殿

適

1. 事件の表示　昭和59年特許願第265638号
2. 発明の名称　食肉用動物の屠殺前処理方法
3. 補正をする者
   事件との関係　特許出願人
   飯村東光（ほか2名）
4. 代理人
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   電話 03－352－1561(代)
5. 補正命令の日付　なし
6. 補正の対象　明細書全文
7. 補正の内容　別紙のとおり

特許庁 60.1.24 出願課 福田

明　細　書

1．発明の名称

食肉用動物の屠殺前処理方法

2．特許請求の範囲

（1）　鳥獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させることを特徴とする食肉用動物の屠殺前処理方法。

3．発明の詳細な説明

（産業上の利用分野）

本発明は、鳥獣、魚等の食肉用動物の屠殺前処理方法にかかり食肉の色を新鮮に保持しかつ血抜き効果を良くする方法に関する。

（従来の技術）

従来獣肉、魚肉等は低温で保持した場合も保存中に肉色が褐色に変化し商品価値を低下するという問題があり、この問題を解決するために発色剤溶液に生肉を浸漬して色調を保つ手段もあるが、手数がかかりかつ生肉本来の色調を出し難いという問題もある。さらに食肉用動物は肉別に血液が残存すると味が悪くなり、かつ血液が含むバクテ

リアによって腐敗し易くなるため屠殺後は直ちに放血して血液を除去するものであるが残存した血液が血塊となって残り外観を害いかつ味を低下させるという問題もあった。

（発明が解決しようとする問題点）

本発明は、上述の問題に鑑み食肉用動物の屠殺後の血抜き効果が良く、かつ食肉の保蔵中の褐変を防ぎ鮮色に保持しようとするものである。

（問題点を解決するための手段）

本発明は、禽獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させることにより、血液及び血管を介して肉質中に酸素の代りに一酸化炭素を結合させ、屠殺後の保蔵される生肉を鮮色に保持させるとともに屠殺後の血液の凝血を防ぎ血抜き効果を高め血塊による品質低下を防止しようとするものである。

（作用）

本発明は、食肉用動物に一酸化炭素を呼吸させることにより血液中及び肉質中のヘモグロビンやミオグロビンに一酸化炭素が結合され、屠殺後の生肉の色を鮮色に保つとともに血液の流動性の低下を防止するものである。

（発明の構成）

本発明の方法を詳述する。

食肉用動物としては牛、豚等の家畜類、鶏等の家禽類、魚類等があり、一酸化炭素呼吸に際しては、家畜類の場合は屠殺に先立って密閉室に入れ、一酸化炭素ガスを室内に吹き込むことによりこれを呼吸させるか或は個々の動物の鼻口部にマスク状に気密状の吸入器を当て、これに一酸化炭素を送り込むことによって吸入させる。禽類の場合は逆さ吊りして放血するがその前に吊下げ状態で一酸化炭素ガス室を通過させるか或は吊下げる前に一酸化炭素ガス室に入れることにより一酸化炭素を呼吸させる。

また魚類の場合は、密閉室中の水槽中で遊泳させ、その水中に一酸化炭素を吹き込むみことにより一酸化炭素を呼吸させる。

ガス室の雰囲気は空気と一酸化炭素を置換させたもの或は空気と一酸化炭素が混合しているもの何れでもよい。

さらに動物は一酸化炭素の呼吸によって死に至らしめるか或は一酸化炭素呼吸後も生存させ他の手段によって屠殺してもよい。

生体に吸入された一酸化炭素は、血液によって血管の末端まで運ばれて血液並に肉質中にくまなく分散し、一酸化炭素は酸素よりも血液並に肉質中のヘモグロビンやミオグロビンと結合し易いから血液並に肉質と結合し屠殺後の生肉の色を全体に亘って鮮色に保つとともに血液の流動性の低下を防止する。即ち禽獣肉の場合は生肉の色を鮮紅色に保ち時間の経過によって褐色に変色するのが防止される、また魚肉の場合は、赤身の魚においては赤色筋と血合い筋の色が鮮紅色となり、白身の魚においては血合い筋の色が鮮紅色となり、数日間空中に放置しても褐色に変色することがない。

また屠殺後の血液の流動性の低下が防止されるから、血抜き効果が良く残存した血液により血塊が生ずるようなことがない。

（発明の効果）

本発明によれば、禽獣、魚等の食肉用動物の呼吸停止前に一酸化炭素を呼吸させるため、食肉用動物が一酸化炭素を呼吸することにより血液中に一酸化炭素がとり入れられ酸素に代って血液並に肉質と結合し屠殺後の血液の流動性の低下を防止するとともに生肉の色を長期に亘って鮮色に保たせることができる。さらに血液の流動性の低下が防止されるため血抜き効果が良く血液の残存による味の低下や腐敗の発生を防止することがでる。また屠殺前の生体に一酸化炭素を呼吸させるため一酸化炭素の分散が血管の末端まで行われたり前述の効果を屠体全体に亘って有効に及ぼすことができる。

（実施例）

本発明の実施例を添附図面によって説明りる。

実施例１

第１図に示されるように実験用ウサギａを、気密箱１に入れ、一酸化炭素ガスボンベ２からガスを送入し、排気弁３を開いて空気を追い出した後は排気弁３を閉じ３０分後ウサギａを死に至らし

めた。図において4は減圧弁、5は送気弁である。

次にウサギaを取出して解体したがその生肉は一酸化炭素を呼吸させないウサギの生肉と比べて鮮紅色を呈しており、血液は流動性が高く血抜きが良好に行われた。さらにこの生肉を0℃～3℃の冷蔵庫内に放置したところ、14日後においても色が褐色に変る現象が起らなかった。

実施例2

第2図に示すように、養殖ハマチb1尾約3kgのものを、バケツに入ったポリエチレン袋6内の海水中に入れ、一酸化炭素ボンベ2から減圧したガスを導入し、ポリエチレン袋6の口をしぼってガスの散逸を防止した。図において7は送気管、8は流量計である。ガスの流量は1ℓ／分とし約20分後横転したハマチbを取出して三枚におろし皮を剥いでその後の変化をみた。その結果、赤色筋と血合の筋の色が鮮紅色を呈し、血抜きは良好であり血液の色が鮮紅色で魚肉全体の色調が鮮かであり、庫内温度0℃～5℃の冷蔵庫内で20日間経過後も色調の変化は殆どみられなった。

なお、一酸化炭素は血液中のヘモグロビンと結合し、酸素の取入れ作用を阻害するのでガス中毒作用があるが、すでに魚の血液中のヘモグロビンや筋肉中のミオグロビンあるいはヘモグロビンと結びついた一酸化炭素が人間の胃に入った場合には、ガス中毒作用はまったく考えられない。事実実験用モルモットに実施例2で処理した魚肉を毎日多量に7日間与え続けたが、なんらの異状を認められなかった。また、同じ魚肉を刺身として試食したところ、味、香など食品としての品質を損なうことがまったく認められなかった。

4．図面の簡単な説明

第1図は本発明の方法に用いられる装置の一実施例を示す側面図、第2図は同上他の実施例を示す側面図である。